Energy Star Showcase Buildings

The Program

- In June 1994, a select group of public and private building owners teamed up with EPA to pilot test EPA's new strategy for achieving maximum energy-efficiency at a profit.
- These Showcase partners have been working under tight schedules to complete energy efficiency upgrades in 24 Showcase buildings around the country.
- The Showcase building projects are demonstrating that the Energy Star Buildings program works to profitably and significantly reduce energy use in commercial buildings.

The Participants

American Standard (Trane)
Boccardo Properties
Bresler Reiner, Inc.
Carrier
Catholic University
Connecticut Mutual Life Insurance
Douglas County
Fannie Mae
Honeywell
J.C. Penney
Johnson Controls
Louisville Municipal Sewer District
Maine College of Art
Mobil Corporation
Mobil Research and Development
Montgomery County
National Wildlife Federation/Resources for the Future
Southern California Gas
State of Ohio
St. Charles Medical Foundation
Target Stores
Vought Aircraft
Warner-Lambert
Washington Times

The Projects

Attached is a fact sheet on each project describing the building, major systems, pre-upgrade energy use, and planned improvements.

3/23/95

American Standard Company
Technology Center
LaCrosse, WI

Building Description

200,000 sf, 2-story office building consisting of an original 1950s building and a mid-1980's addition.

Original HVAC

Air handling systems include both variable air volume and constant volume. Cooling is provided by 180-ton and 350-ton chillers and an ice storage system, while steam heated by a central coal/gas-fired boiler is piped through steam coils in the air handling units.

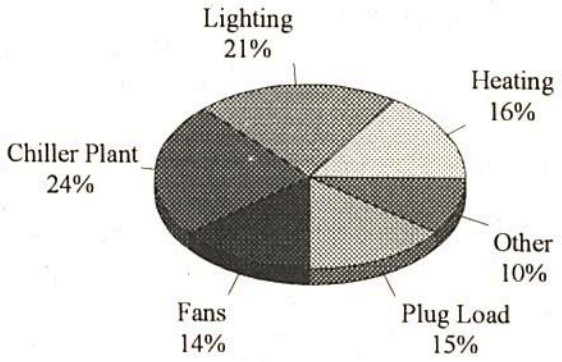
Baseline Energy Use

74 kBtu/sf/yr.

Baseline Energy Cost

$1.24/sf/yr.

Energy End Uses



Planned Improvements

Delamp to reduce lighting levels to IES recommendations.

Install reflectors that improve the efficiency of existing fixtures.

Install occupancy sensors for lighting control.

Replace existing chillers with high-efficiency, CFC-free chillers equipped with variable-speed drives.

Owner Contact

Bob Roach (608) 787-4602.

EPA Contact

Bob Rose (202) 233-9744.

3/21/95

Boccardo Properties
Community Towers Building
San Jose, CA

Building Description

350,000 sf twin-tower office building consisting of a 174,000 sf, 10-story tower built in 1962 and a 176,000 sf, 12-story tower built in 1965.

Original HVAC

Constant volume system with two, 125-hp fans per tower, heating by a 5,000 kBtu/hr gas-fired steam boiler, and cooling by two, 484-ton chillers (lead/lag backup rarely used). Additional cooling is provided by a plate and frame heat exchanger.

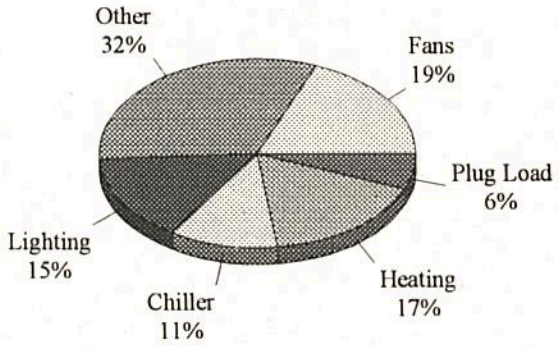
Baseline Energy Use

70 kBtu/sf/yr.

Baseline Energy Cost

$1.64/sf/yr.

Energy End Uses



Planned Improvements

Install T8 fluorescent lamps, electronic ballasts, specular reflectors, and occupancy sensors.

Convert fan system from constant volume to variable volume, and install variable-speed drives on fan motors.

Replace chillers with high-efficiency R-22 screw chillers.

Install new energy management system.

Owner Contact

Taylor Clayton (408) 286-9101.

EPA Contact

Chris O'Brien (202) 233-9146.

3/23/95

Bresler Reiner, Inc.
Waterside Mall
Washington, DC

Building Description

Office-retail complex consisting of two, 210,000 sf, 12-story office towers connected by a 644,000 sf one-story retail mall area.

Original HVAC

5 variable air volume systems and 3 constant volume systems, with central heating provided by a gas-fired boiler and oil-fired backup boiler. Cooling plant consists of an 871-ton chiller in each tower, and two 1,068-ton chillers for the mall area.

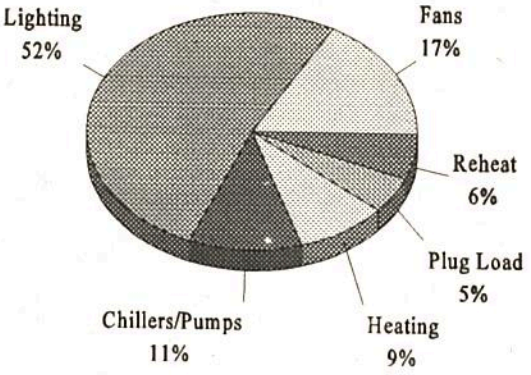
Baseline Energy Use

52 kBtu/sf/yr.

Baseline Energy Cost

$0.80 sf/yr.

Energy End Uses



Planned Improvements

Install high-efficiency lamps, ballasts, and fixtures (including task lighting) in office towers, and install occupancy sensors in offices.

Install high-efficiency motors and variable speed drives on fan systems.

Replace each tower chiller with 794-ton chiller and replace mall chillers with two, 700-ton chillers. All chillers to be high-efficiency type with HCFC-123 refrigerant.

Owner Contact

Ahmed Haeri (202) 488-8800.

EPA Contact

Chris O'Brien (202) 233-9146.

3/20/95

Carrier Corporation Headquarters Facility Syracuse, NY

Building Description

Mixed use facility built in 1957 and consisting of a 2-story, 64,000 sf office building connected to a one-story research facility and linked by a common core containing the lobby, cafeteria, and auditorium. Only the 2-story office building is undergoing an Energy Star Buldings upgrade.

Original HVAC

Five separate and varied air handling systems serve the building, with central hot water heating provided by remote-source steam, and cooling provided by 2 centrifugal chillers (300 and 200 tons).

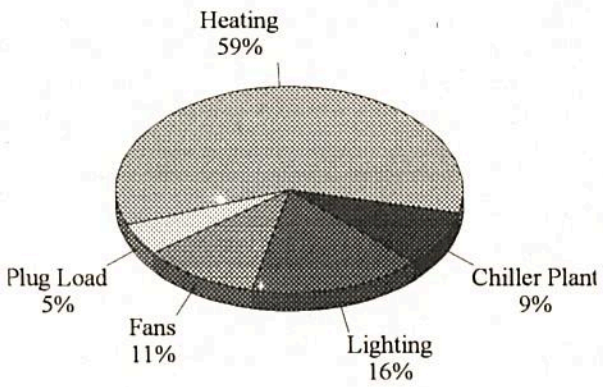
Baseline Energy Use

196 kBtu/sf/yr.

Baseline Energy Cost

$2.76/sf/yr.

Energy End Uses



Planned Improvements

Install high-efficiency lighting system.

Install additional roof insulation to reduce HVAC demand.

Replace one chiller with high-efficiency CFC-free model.

Owner Contact

Daniel Leff (800) 360-3637.

EPA Contact

LaMont Noble (202) 233-9324.

3/20/95

The Catholic University of America
Hartke Theater
Washington, DC

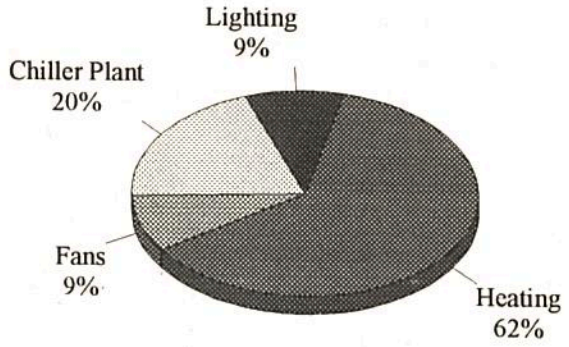
Building Description 3-story, 51,440 sf theater/classroom facility built in the late 1960s.

Original HVAC Constant volume system with 7 air handlers and 2 heating/ventilating units. Central cooling is provided by a 114-ton chiller and central heating is provided by a campus-wide steam system.

Baseline Energy Use 103 kBtu/sf/yr.

Baseline Energy Cost $ 2.39/sf/yr.

Energy End Uses



Planned Improvements Install high-efficiency lighting system.

Reduce loads by installing window films and a new roof.

Convert air-handling systems from constant volume to variable air volume, and install variable-speed drives on fan motors.

Replace existing chiller with 100-ton high-efficiency chiller.

Reduce overall building steam use.

Owner Contact Robert Burhenn (202) 319-5123.

EPA Contact Roger Mosier (202) 233-9405.

3/20/95

Connecticut Mutual Life Insurance Headquarters Building Hartford, CT

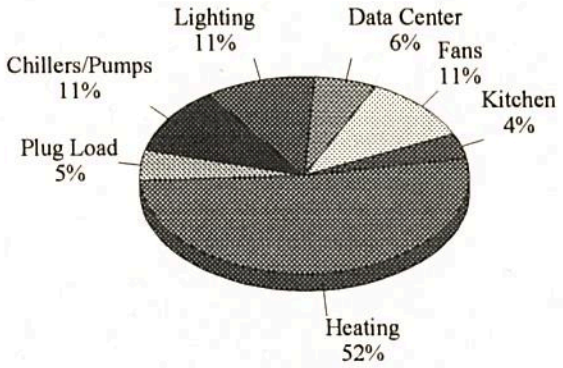
Building Description 484,300 sf office building built in 1924 with additions in 1940, 1956, and 1970.

Original HVAC Constant volume air handling with heating by 4 gas-fired steam boilers and cooling by 5 chillers totalling 2,415 tons.

Baseline Energy Use 201 kBtu/sf/yr.

Baseline Energy Cost $2.89/sf/yr.

Energy End Uses



Planned Improvements Install high-efficiency lamps, ballasts, and fixtures (including task lighting). Install occupancy sensors in offices. Install window films.

Replace burners and controls on 2 boilers, install variable-speed drives on feedwater pumps, and install pulse-type condensing heater for domestic hot water.

On a pilot scale, convert to variable air volume system and install variable-speed drives on fan motors.

Retire existing chillers and install three, 600-ton R-123 chillers.

Owner Contact John LaBelle (203) 987-6730.

EPA Contact Chris O'Brien (202) 233-9146. 3/20/95

Douglas County Government
Old Courthouse Building and Justice Building
Roseberg, OR

Building Description

The buildings include County courts, detention facilities, and offices. The Old Courthouse Building was built in 1929 and contains 79,800 sf. The Justice Building was built in 1976 and contains 174,200 sf.

Original HVAC

Two, 250kW electric boilers provide heating while two, 365-ton centrifugal chillers supplemented by window air conditioners provide cooling. Justice Building has variable air volume system with hot water reheat. Old Courthouse has window air conditioners.

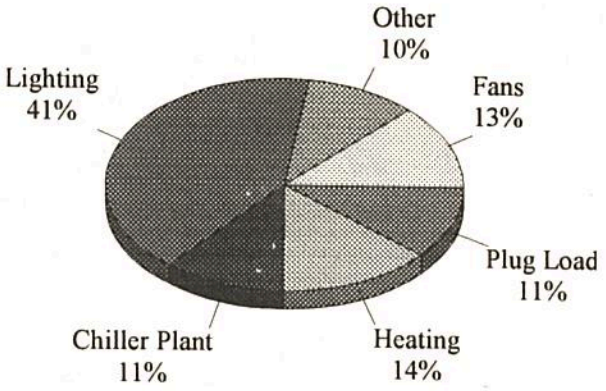
Baseline Energy Use

96 kBtu/sf/yr.

Baseline Energy Cost

$0.82/sf/yr.

Energy End Uses



Planned Improvements

Building-wide lighting upgrade.

Install high-efficiency fan motors and variable-speed drives.

Replace 2 electric boilers with one, 600 kBtu/hr gas-fired boiler.

Upgrade the energy management systems.

Owner Contact

John Walker (503) 440-6098.

EPA Contact

LaMont Noble (202) 233-9324.

3/20/95

Federal National Mortage Association Headquarters Building Washington, DC

Building Description

250,000 sf office building arranged in 2 principle wings that were built in phases between 1960 and 1976 - an original 4-story East Wing and a newer, 3-story West Wing.

Original HVAC

Over 40 different air handling systems serve the building. Dominant systems include high pressure induction, variable volume reheat, and variable temperature constant volume. Central plant includes 2 oil-fired steam boilers, and 5 chillers totalling 1,670 tons. Additionally, 13 computer room air conditioners run continually.

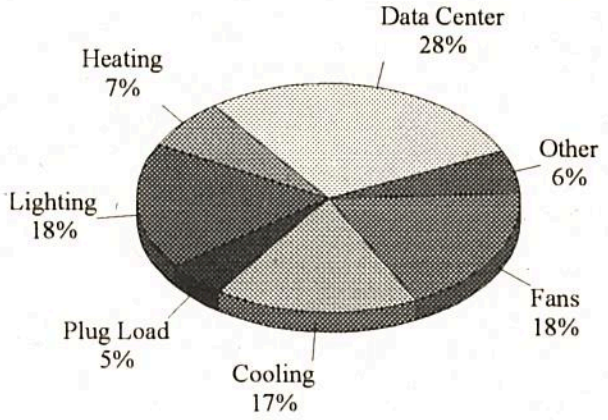
Baseline Energy Use

211 kBtu/sf/yr.

Baseline Energy Cost

$3.51/sf/yr.

Energy End Uses



Planned Improvements

Install high-efficiency lighting system.

Upgrade energy management system to automate controls, and install window films on large glass areas.

Install variable-speed drives on fan motors, convert air distibution system to variable air volume, replace chiller with high-efficiency CFC-free model.

Owner Contact

Jeff Robertson (202) 752-4836.

EPA Contact

Bob Rose (202) 233-9744.

3/20/95

Honeywell, Inc.
Headquarters Facility
Minneapolis, MN

Building Description

958,000 sf campus-like office complex with 3 main buildings.

Original HVAC

Extensive variable air volume, temperature-controlled air handlers. Chiller plant totals 1,995 tons, while two, 300-hp boilers supply heat to 2 buildings. The third building is primarily heated by a glycol system that circulates waste heat from the computer center.

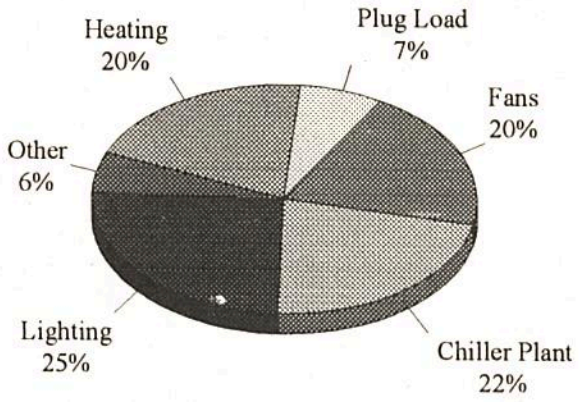
Baseline Energy Use

111 kBtu/sf/yr.

Baseline Energy Cost

$1.01/sf/yr.

Energy End Uses



Planned Improvements

T8 lamps, electronic ballasts, occupancy sensors, LED exit signs.

Implement building-wide tune-up and new O&M plan. Initiate night setback, install timeclocks on vending machines and water coolers for off-hours shutdown. New energy management system.

Install variable-speed drives on fan motors, replace groundwater cooling system with mechanical refrigeration, reduce steam pressure, tune-up boiler, install de-stratification fans in Boiler Room to raise combustion air temperature, implement water treatment program.

Owner Contact

John Rousseau (612) 951-3263.

EPA Contact

Bob Rose (202) 233-9744.

3/23/95

J.C. Penney Company, Inc.
Cumberland Mall Store
Atlanta, Georgia

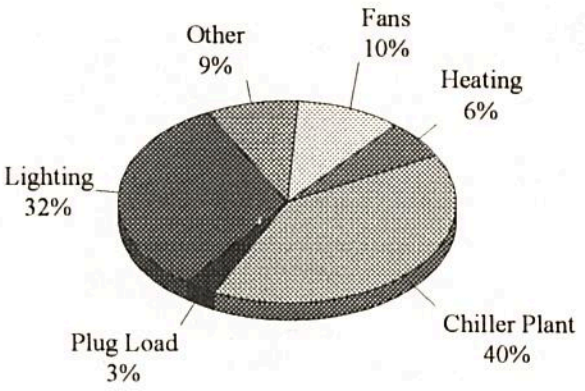
Building Description 161,500 sf, 2-story retail store constructed in 1972.

Original HVAC Constant air volume system with electric duct heaters for heating and twin, 250-ton, centrifugal chillers for cooling. An additional split system is used to supply cooling to the offices and beauty shop.

Baseline Energy Use 64 kBtu/sf/yr.

Baseline Energy Cost $1.31/sf/yr.

Energy End Uses



Planned Improvements Building-wide lighting upgrade

Replace one chiller with a 250-ton natural gas-engine-driven chiller

Convert air distribution to variable air volume.

Upgrade the energy management system.

Install new cooling tower.

Owner Contact Alan Rose (214) 431-1510.

EPA Contact LaMont Noble (202) 233-9324.

3/23/95

Johnson Controls, Inc.
Headquarters Facility
Milwaukee, WI

Building Description

315,000 sf distributed among an office complex of 6 individual buildings. A 130,000 sf expansion is planned.

Original HVAC

Constant volume fan system, 2 chillers (270-ton air-cooled and 435-ton water-cooled), with heat provided by a constant volume steam converter.

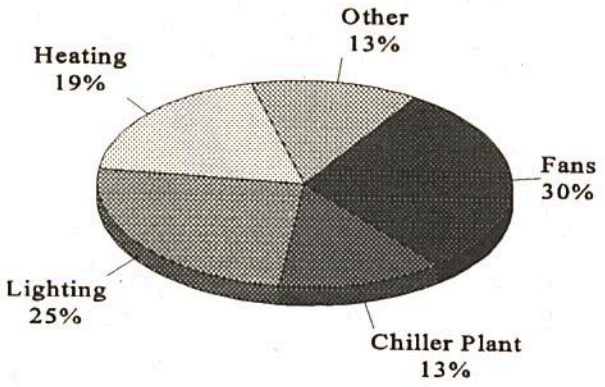
Baseline Energy Use

122 kBtu/sf/yr.

Baseline Energy Cost

$1.45/sf/yr.

Energy End Uses



Planned Improvements

Retrofit or replace incandescent fixtures with compact fluorescents, and install occupancy sensors for lighting control. Note: A substantial amount of lighting upgrade work had been completed prior to the Showcase Buildings program.

Evaluate options for converting to variable air volume system.

Install new high-efficiency, CFC-free chillers.

Owner Contact

Pete Hauser (414) 274-4000.

EPA Contact

Bob Rose (202) 233-9744.

3/21/95

Louisville Municipal Sewer District
Headquarters Building
Louisville, KY

Building Description

77,000 sf 3-story office building built in 1983. Building has been vacant since July 1994 with re-occupancy scheduled for April 1995.

Original HVAC

Variable air volume system with 4 air handlers and electric resistance heaters in the ducts. Central cooling is provided by an 11-year old, 150-ton chiller and a 2-year old, 60-ton chiller.

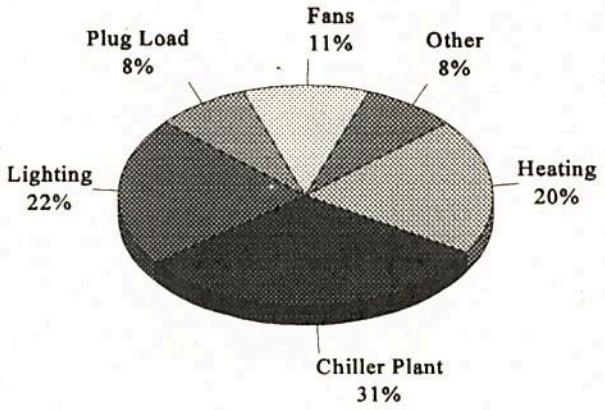
Baseline Energy Use

120 kBtu/sf/yr.

Baseline Energy Cost

$1.79/sf/yr.

Energy End Uses



Planned Improvements

Install energy-efficient lighting system including T8 lamps, electronic ballasts, occupancy sensors, and task lighting.

Install energy management system and use to monitor energy end-uses.

Install variable-speed drives on all air-handling unit fan motors.

Evaluate replacing 11-year old chiller with CFC-free chiller.

Owner Contact

James Hunt (502) 540-6114

EPA Contact

Chris O'Brien (202) 233-9146.

3/21/95

Maine College of Art
Art Education Center
Portland, ME

Building Description

150,000 sf, 5-story, 1920s-vintage retail facility. Major renovation converting building into an educational facility is underway. Project is unusual in that complete new systems, rather than retrofits, are being installed.

Original HVAC

All HVAC systems had been were removed prior to the start of the Showcase Building project.

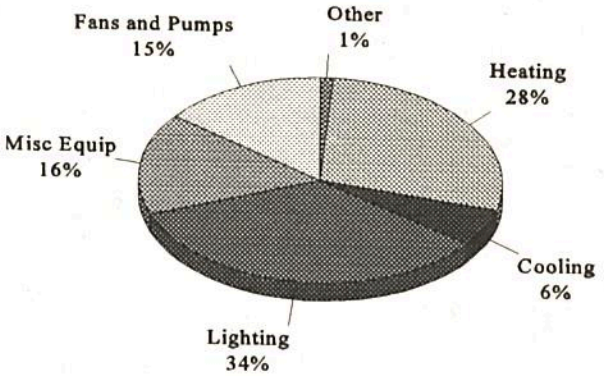
Baseline Energy Use

145 Btu/sf/yr. Energy data are estimates based on computer simulations of expected performance if the building was built to be minimally-compliant with today's building/energy code.

Baseline Energy Cost

$2.27/sf/yr.

Energy End Uses



Planned Improvements

Combination of natural and high-efficiency lighting system.

Exterior wall and roof upgrades to improve thermal performance.

Variable air volume system with variable-speed driven fan motors.

Gas-fired absorption chiller and 3 high-efficiency gas-fired boilers.

Owner Contact

Richard Renner (207) 775-0443.

EPA Contact

Chris O'Brien (202) 233-9146.

3/21/95

Mobile Corporation/LaSalle Partners
Fountain Square I & II
Reston, VA

Building Description

Two office buildings:
Fountain Square I - 285,000 sf, constructed in 1990;
Fountain Square II - 320,000 sf, constructed in 1991.

Original HVAC

Single duct, variable air volume system with an air handler on each floor. Cooling is provided by packed AC units, one per floor in both buildings. Heating consists of electric reheat. Water-source heat pumps provide space conditioning for first floor retail shops.

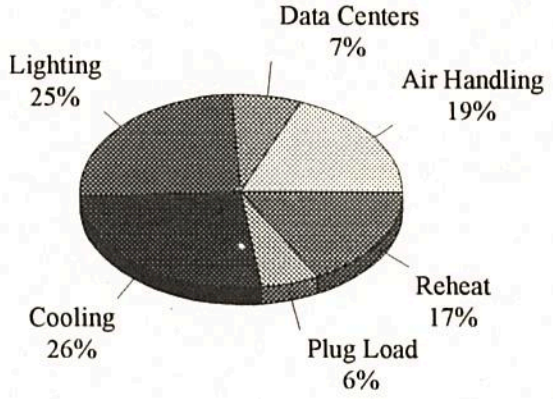
Baseline Energy Use

96 kBtu/sf/yr.

Baseline Energy Cost

$ 1.62/sf/yr.

Energy End Uses



Planned Improvements

Install high-efficiency lighting systems.

Optimize control systems.

Install window films.

Install variable-speed drives in Fountain Square I.

Improve efficiency of cooling tower fan motors.

Owner Contact

Joe Donovan (703) 709-8500.

EPA Contact

Roger Mosier (202) 233-9405.

3/23/95

Mobil Research & Development Corporation
Farmers Branch Facility
Dallas, TX

Building Description

340,000 sf consisting of 120,000 sf of research laboratories and 100,000 sf of rentable office space. The facility was built in 1991.

Original HVAC

The building has a 16 single-duct air handling units - 4 serving lab space and 12 serving office space. The central heating and cooling plant includes two, 400 hp gas-fired boilers, and 5 chillers having a combined capacity of 1,750 tons.

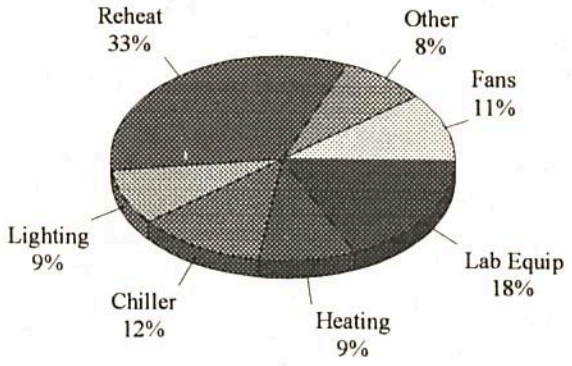
Baseline Energy Use

269 kBtu/sf/yr.

Baseline Energy Cost

$2.72/sf/yr.

Energy End Uses



Planned Improvements

Upgrade lighting to T8 lamps and electronic ballasts, and install occupancy sensors.

Reset supply air temperature for lab spaces.

Replace 5 chillers with energy-efficient R123 chillers and employ staged operation.

Install variable-speed drives on cooling tower cells and chilled water pumps.

Owner Contact

John Meek (214) 851-8382.

EPA Contact

Bob Rose (202) 233-9744.

3/22/95

Montgomery County Government
Hungerford Office Building
Rockville, MD

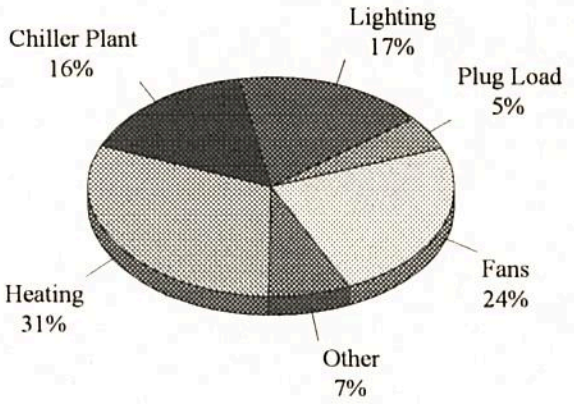
Building Description 84,000 sf, 7-story office building constructed in 1986.

Original HVAC Each floor is served by a variable air volume air handler with heating by electric reheat and central cooling provided by a 9-year old, 262-ton chiller.

Baseline Energy Use 160 kBtu/sf/yr.

Baseline Energy Cost $2.72/sf/yr.

Energy End Uses



Planned Improvements Delamp and install T8 lamps with electronic ballasts. Replace exterior lighting with high-pressure sodium system. Install occupancy sensors and other automatic lighting controls.

Re-calibrate reheat coils in VAV boxes to eliminate excess reheat, reset thermostats, and recommission the HVAC system.

Install variable-speed drives on all air handling unit fan motors.

Install new controller on chiller, and variable-speed drive on chilled water pump.

Owner Contact Homeira Razavi (301) 217-6097.

EPA Contact Bob Rose (202) 233-9744. 3/30/95

National Wildlife Federation/ Resources for the Future Washington, D.C.

Building Description

The Resources and Conservation Center is comprised of two, 7-story buildings that share a common foyer. One building is 76,000 sf and was built in 1959, while the other is 168,000 sf and was built in 1986.

Original HVAC

Both buildings are served by a central plant with 280-ton and 390-ton chillers and an ice storage system. Older building has constant volume system with 2 main air handlers, reheat coils, induction units. Newer building has variable air volume system with 2 air handlers.

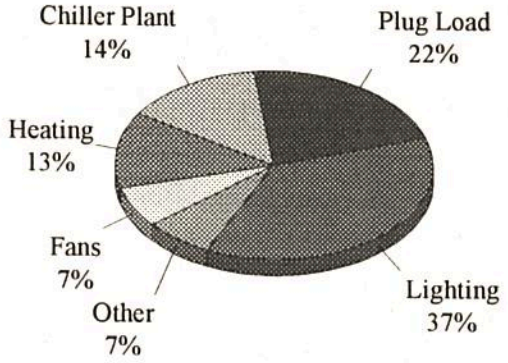
Baseline Energy Use

66 kBtu/sf/yr.

Baseline Energy Cost

$1.63/sf/yr.

Energy End Uses



Planned Improvements

Building-wide lighting upgrade with occupancy sensors

Replace 280-ton chiller with new, high-efficiency CFC-free type.

Replace 25-year-old fan motors with high-efficiency models.

Install new air handlers in older building.

Owner Contact

Joe Luers (202) 328-5130.

EPA Contact

LaMont Noble (202) 233-9324.

3/23/95

Southern California Gas Company
Energy Resource Center
Downey, California

Building Description

44,000 sf demonstration project built largely out of materials from old buildings previously on site (which were dismantled piece-by-piece), and other recycled products. It will be used to showcase non-traditional construction techniques and the latest energy-efficiency and environmental technologies.

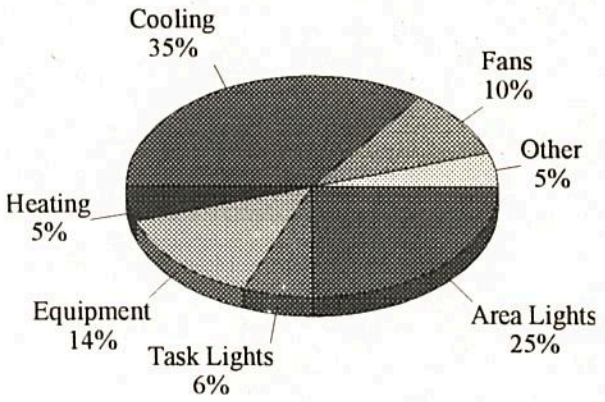
HVAC

A variety of systems are being installed to demonstrate the array of current technologies, including desiccant, absorption, centrifugal, and evaporation cooling units.

Baseline Energy Use

66 kBtu/sf/yr. Energy data are estimates based on computer simulations of expected performance if the building was built to be minimally-compliant with today's building/energy code.

Energy End Uses



Planned Improvements

State-of-the-art lighting systems.

HVAC system will consist of various technologies including desiccant, absorption, centrifugal, and evaporation cooling units.

Overall performance of the combined systems will be slightly less than a single system, but the variety will allow building owners to see several different technologies.

Owner Contact

Will Clark (213) 244-5646.

EPA Contact

LaMont Noble (202) 233-9324.

3/22/95

State of Ohio
Frank Lausche Building
Cleveland, OH

Building Description

Office building housing the Ohio Building Authority and containing 435,000 sf in 13 floors. The building was constructed in 1977.

Original HVAC

Variable air volume system with hot water heating provided by steam distributed by the City. A gas-fired steam boiler provides domestic hot water. Cooling is provided by two, 16-year old, 537-ton centrifugal chillers. In addition, several spaces are served by packaged units.

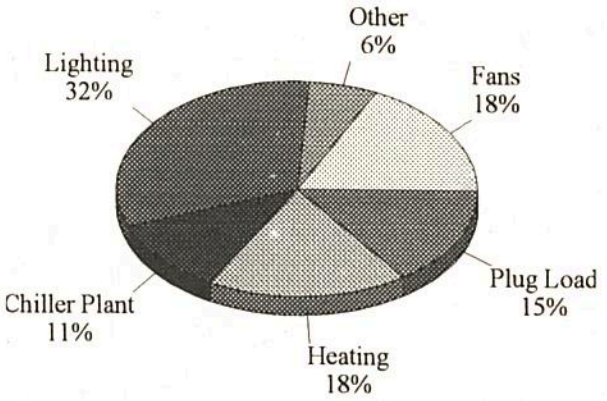
Baseline Energy Use

101 kBtu/sf/yr.

Baseline Energy Cost

$1.93/sf/yr.

Energy End Uses



Planned Improvements

Building-wide lighting upgrade.

Install high-efficiency fan motors and variable-speed drives.

Install motorized dampers on on each floor main branch duct to restrict off-hours cooling to occupied areas.

Install 2 new 350-ton, HCFC-123 centrifugal chillers.

Owner Contact

Mark Jenkins (216) 787-3840.

EPA Contact

LaMont Noble (202) 233-9324.

3/22/95

St. Charles Medical Foundation
St. Charles Medical Center
Bend, Oregon

Building Description

6-story, 224,000 sf medical facility consisting of an original office building built in 1973, with exam, treatment, laboratory and rehabilitation facilities added in 1984 and 1989.

Original HVAC

100% outside air constant volume system with reheat and economizers. The cooling plant includes an 800-ton centrifugal chiller, a new 400-ton heat recovery chiller, and a 354-ton absorption machine for emergency back-up. Two gas-fired boilers provide steam for domestic hot water and space heating.

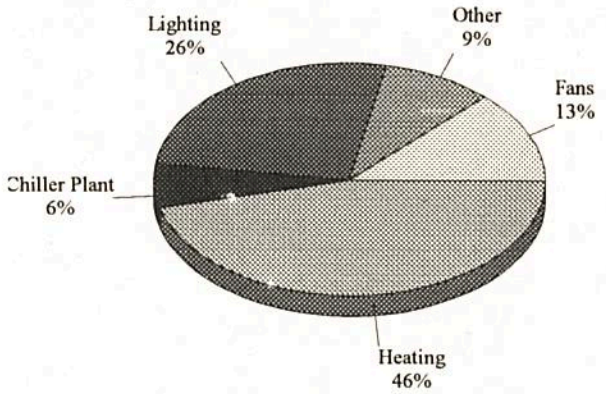
Baseline Energy Use

372 kBtu/sf/yr.

Baseline Energy Cost

$1.91/sf/yr.

Energy End Uses



Planned Improvements

Building-wide lighting upgrade.

Install high-efficiency fan motors and variable-speed drives.

Convert fan system to variable-air volume.

Install an additional 400-ton heat recovery centrifugal chiller.

Owner Contact

Mike Severns (503) 388-7720.

EPA Contact

LaMont Noble (202) 233-9324.

3/22/95

Target Stores
Store 293
Fullerton, California

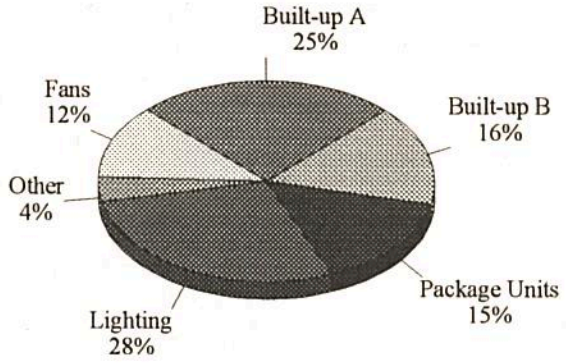
Building Description 104,000 sf, one-story square retail store.

Original HVAC Cooling is provided by four, 29-ton rooftop package units and two built-up units with a 60-ton and 85-ton compressor. The building has no heating system.

Baseline Energy Use 55 kBtu/sf/yr.

Baseline Energy Cost $1.63/sf/yr.

Energy End Uses



Planned Improvements Building-wide lighting upgrade with skylights.

Construct vestibule/airlock at store entrance.

Install new high-efficiency rooftop package units.

Install new built-up unit with water-cooled condenser and variable-speed drive on fan motor.

Upgrade energy management system.

Owner Contact James P. Boler (612) 334-3785.

EPA Contact LaMont Noble (202) 233-9324.

3/22/95

Vought Aircraft Company
Buildings 7 & 49
Dallas, TX

Building Description

Building 7: Office building containing 217,000 sf;
Building 49: Office building containing 132,000 sf. Both buildings were constructed in 1948.

Original HVAC

The Vought complex includes a central utility plant with 5,000 tons of chiller capacity. Numerous air handling units provide constant volumes of air to each office area with hot water reheat coils and multizone air distribution systems providing air tempering to maintain space temperature.

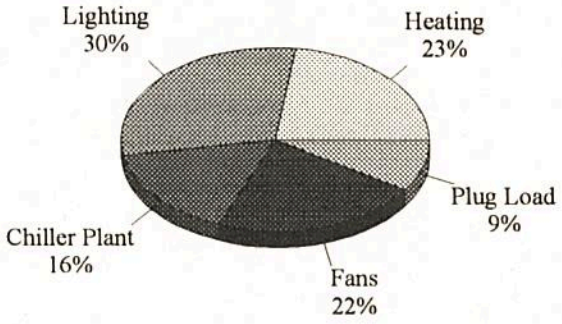
Baseline Energy Use

65 kBtu/sf/yr.

Baseline Energy Cost

$0.77/sf/yr.

Energy End Uses



Planned Improvements

Replace T12 lamps with energy-efficient T8s, install electronic ballasts, and replace incandescent fixtures with compact fluorescent type.

Convert air handling system to variable air volume and install variable-speed drives on fan motors.

Owner Contact

Martin Davis (214) 266-8287.

EPA Contact

Bob Rose (202) 233-9744.

3/22/95

Warner-Lambert Company
Headquarters Building 86
Morris Plains, NJ

Building Description

125,000 sf office building constructed in 1986.

Original HVAC

5 variable air volume systems and 3 constant volume systems, with central heating provided by a gas-fired boiler and oil-fired backup boiler, and cooling provided by two, 250-ton chillers. There are also 2 computer room air conditioning units.

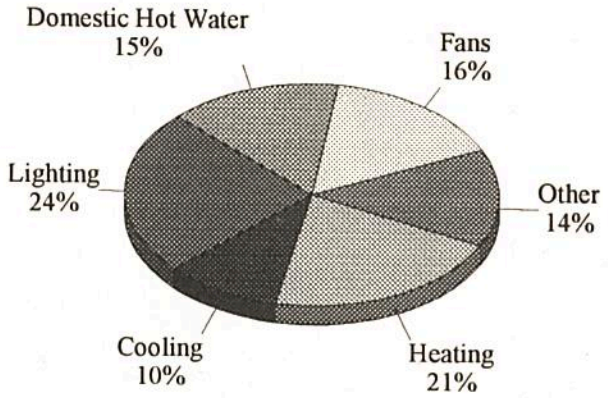
Baseline Energy Use

119 kBtu/sf/yr.

Baseline Energy Cost

$2.04/sf/yr.

Energy End Uses



Planned Improvements

Install high-efficiency lamps, ballasts, and fixtures (including task lighting). Install occupancy sensors in offices.

Install high-efficiency motors and variable-speed drives.

Install low-flow shower heads and reduce hot water temperature.

Re-program energy management and control system so space conditioning matches typical hours of occupancy.

Evaluate installation of high-efficiency CFC-free chiller.

Owner Contact

Doanh Van (201) 540-4673.

EPA Contact

Chris O'Brien (202) 233-9146.

3/22/95

The Washington Times Headquarters Building Washington, DC

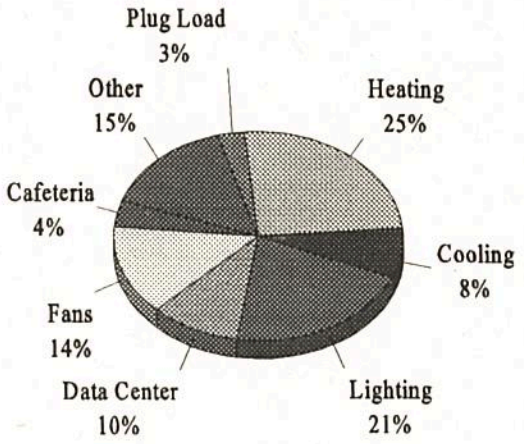
Building Description 120,000 sf, 3-story office building built in 1957.

Original HVAC Combination of variable and constant volume systems, with heating and cooling provided by 9 rooftop units with 280 tons of combined cooling capacity. Additionally, there are 2 air-cooled condensing units and a heat pump. A gas-fired steam boiler feeds steam to the rooftop units, kitchen, and domestic hot water system.

Baseline Energy Use 111 kBtu/sf/yr.

Baseline Energy Cost $2.25/sf/yr.

Energy End Uses



Planned Improvements Complete Green Lights upgrade including building-wide installation of T8 fluorescent lamps, electronic ballasts, and occupancy sensors.

Replace existing rooftop packaged units with smaller, load-matched, high-efficiency units having variable-speed drives on fan motors.

Evaluate the potential for installing a gas-fired water heater to allow shut-down of the boiler during summer months.

Owner Contact Joe Butler (202) 636-4706.

EPA Contact Chris O'Brien (202) 233-9146.

3/23/95